REMARKS

The application has been reviewed in light of the Office Action dated July 5, 2005. Claims 21, 24, 27, 30, 33, 36, 39, 42 and 44-48 were pending. Claims 1-20, 22, 23, 25, 26, 28, 29, 31, 32, 34, 35, 37, 38, 40, 41 and 43 were previously canceled, without prejudice or disclaimer. By this Amendment, new claims 49-57 have been added, and claims 21, 44 and 47 have been amended to clarify the claimed invention. Accordingly, claims 21, 24, 27, 30, 33, 36, 39, 42 and 44-57 are now pending, with claims 21, 44, 47 and 51 being in independent form.

Claims 21, 24, 27, 30, 33, 36, 39 and 42 were rejected under 35 U.S.C. §102(b) as allegedly fully anticipated by European Patent Application No. EP 0 717 404 (hereinafter "Yamada '404"). Claims 21, 24, 27, 30, 33, 36, 39 and 42 were rejected under 35 U.S.C. §102(b) as allegedly fully anticipated by European Patent Application No. EP 0 735 158 (Ide et al.). Claims 21, 24, 27, 30, 33, 36, 39 and 42 were rejected under 35 U.S.C. §102(b) as allegedly fully anticipated by Japanese Patent Application No. JP 03-240590 (hereinafter "Iwasaki '590"). Claims 21, 24, 27, 30, 33, 36, 39 and 42 were rejected under 35 U.S.C. §102(b) as allegedly fully anticipated by Japanese Patent Application No. JP 04-078031 (hereinafter "Iwasaki '031"). Claims 21, 24, 27, 30, 33, 36, 39 and 42 were rejected under 35 U.S.C. §102(b) as allegedly anticipated by Japanese Patent Application No. JP 11-070737 (Yuzurihara et al.). Claims 21, 24, 27, 30, 33, 36, 39 and 42 were rejected under 35 U.S.C. §102(a) as allegedly anticipated by Japanese Patent Application No. JP 2002-002116 (hereinafter "Miura '116"). Claims 21, 24, 27, 30, 33, 36, 39 and 42 were rejected under 35 U.S.C. §102(e) as allegedly anticipated by U.S. Patent Application No. 6,479,121 to Miura et al. (hereinafter "Miura '121"). Claims 21, 24, 27, 30, 33, 36, 39 and 42 were rejected under 35 U.S.C. §102(b) as allegedly anticipated by European Patent Application No. EP 0847049 (hereinafter "Ohno '049"). Claims 21, 24, 27, 30, 33, 36, 39 and 42 were rejected under 35 U.S.C. §102(b) as allegedly fully anticipated by U.S. Patent

Application No. 6,294,310 to Ohno et al. (hereinafter "Ohno '310"). Claims 21, 24, 27, 30, 33, 36, 39 and 42 were rejected under 35 U.S.C. §102(b) as allegedly anticipated by U.S. Patent Application No. 6,242,157 to Tominaga. Claims 21, 24, 27, 30, 33, 36, 39, 42 and 44-48 were rejected under 35 U.S.C. §103(a) as purportedly unpatentable over either one of Yamada, Ide, Iwasaki '590 or Yuzurihara, in view of U.S. Patent No. 6,609,175 to Ando et al. and either of European Patent Application No. EP 1111598 (hereinafter "Suzuki '598") or U.S. Patent No. 6,621,780 to Suzuki. (hereinafter "Suzuki '780").

Applicant has carefully considered the Examiner's comments and the cited art, and respectfully submits that independent claims 21, 44 and 47 are patentable over the cited art, for at least the following reasons.

This application is directed to rewritable optical recording media comprising a phase-change type recording layer which are configured for repeated read/write/erase operations. During recording of such an optical recording medium, the laser selectively heats tiny areas of the recording layer to change the phase of each heated area from more crystalline into less crystalline (also known as "amorphous") phase, in order to create marks that can be called "pits". During erase, the laser changes the amorphous areas back into more crystalline areas. Since the recording layer is in the amorphous state immediately after layer formation, the optical recording medium needs to be initialized before it can be used practically. Amongst the many factors that can affect recording characteristics, the parameters of the initialization process (for example, energy density, scanning speed, initialization power, etc.) have a substantial effect on the recording characteristics, such as overwrite capability, of the initialized medium.

Conventional initialization techniques apply a scanning beam spot which supplies an energy density in the range of 1100 J/m^2 to 1400 J/m^2, for example, in the case of CD-RW discs having linear recording velocities of 1.2 to 4.8 m/sec.

Applicant found through substantial experimentation (see table 4) that improved recording characteristics can be maintained consistently if the energy density supplied by a scanning beam of the output laser power for the initialization process is in a range of 600 J/m^2 to 1000 J/m^2. However, as the data Applicant collected shows, in some instances in which the energy density exceeds 1000 J/m^2, acceptable jitter values were obtained, although not consistently.

Independent claim 21 is directed to a rewritable phase-change optical recording medium which is initialized by irradiating the recording medium with a scanning beam spot emitted from a high power semiconductor laser device, wherein an energy density input by the beam spot is in a range of 600 J/m^2 to 1000 J/m^2.

In addition, recording power also affects write and readout characteristics of the phase-change optical recording medium. For example, when the laser power is too high during recording, damage results to the recording track.

Applicant devised techniques for determining parameters for selecting an optimum recording power for a phase-change optical recording medium and then recording the parameters in advance in the recording layer of the optical recording medium. The parameters are used to determine an optimum recording power for the optical recording medium.

Independent claim 44 is directed to a phase-change optical recording medium comprising a recording layer which contains information recorded in advance therein corresponding to S and R values for selecting an optimum recording power.

Independent claim 47 is directed to a phase-change optical recording medium comprising a recording layer which contains information regarding a P_t value recorded in advance therein, the P_t value corresponding to an optimum recording power.

Yamada '404, as understood by Applicant, is directed to a sputtering target for fabricating

a recording layer of a phase-change type optical recording medium. In particular, Yamada '404 teaches that a sputtering target of a specified composition and a recording layer of a specified composition would tend to yield a recording medium with desired characteristics (such as maximum number of repeated overwriting operations).

It is contended in the Office Action that each of the media disclosed in Yamada '404 is initialized and the initialization is **equivalent**.

It is well-established that equivalence is not (and has never been) the test of anticipation under 35 U.S.C. §102 or the test of obviousness under 35 U.S.C. §103. Further, it is the burden of the Patent Office to make a prima facie showing that each and every feature of the claimed invention is disclosed or suggested by a single reference. Such a showing has not been made in connection with this case. Absent such a showing, Applicant does not have a burden to prove that the media disclosed by Yamada '404 have not been initialized as claimed.

Further, the contention in the Office Action that the optical recording media of Yamada '404 are equivalent to the rewritable phase-change optical recording medium of claim 21 is apparently based on the disclosure in Yamada '404 of the C/N characteristics of the media. However, such C/N characteristics do not disclose the overwrite capability of the initialized rewritable phase-change optical recording medium as provided by the claimed invention (see, for example, claims 49 and 50). The optical recording media of Yamada '404 simply do not disclose the properties of the claimed invention of claim 21.

The Office Action further contends that claim 21 is a product by process claim.

Applicant disagrees. The parameters of initialization specify overwrite properties of the initialized rewritable phase-change optical recording medium. A rewritable phase-change optical recording medium initialized with a scanning beam spot supplying an energy density in a range of 600 J/m^2 to 1000 J/m^2, as pointed out in the application, has a 3T land jitter below 35 nsec

after 1000 cycles of direct overwrite.

According to the Office Action, the optical recording media of Yamada '404 are conventionally initialized. However, as pointed out in the application conventional initialization techniques typically utilize a scanning beam spot supplying an energy density of 1100 J/m^2 or above.

Yamada '404 simply does not teach or suggest an initialized phase-change optical recording medium, as provided by the claimed invention of claim 21.

Ide, as understood by Applicant, is directed to techniques for forming a recording layer of a phase-change type optical recording medium by using a sputtering target. Ide teaches that a sputtering target of a specified composition and a recording layer of a specified composition would tend to yield a recording medium with desired characteristics (such as maximum number of repeated overwriting operations).

Examples 3 and 5-7 and comparative examples 2 and 3 of Ide were cited in the Office Action for their respective constitutions. Examples 3, 5-7 and 10 of Ide were cited as disclosing having undergone 7,000, 10,000, 8,000, 10,000 and 15,000 overwrites, respectively, before experiencing a sudden increase in jitter. However, no jitter values are provided. Thus, one cannot determine whether the examples had a good jitter value to start.

In any event, Ide does not teach or disclose that the energy density during initialization can affect the overwrite capability of the medium. Applicant does not find teaching or suggestion in Ide of an initialized phase-change optical recording medium as provided by the claimed invention of claim 21.

Iwasaki '590 is discussed in the Discussion of Background section of this application. Iwasaki '590, as understood by Applicant, is directed to enhanced recording/erasure sensitivity of a phase-change type recording medium by utilizing a recording layer having as a main component

thereof an alloy of a specific chalcopyrite compound.

Examples E and F in table 1 of Iwasaki '590 were cited in the Office Action as purportedly showing that there is not an increase in C/N or jitter after 10,000 overwrites.

However, Iwasaki '590, like the other cited references, does not teach or suggest that the energy density during initialization can affect the overwrite capability of the medium. Applicant does not find teaching or suggestion in Iwasaki '590 of an initialized phase-change optical recording medium as provided by the claimed invention of claim 21.

Iwasaki '031, as understood by Applicant, is directed to improving recording sensitivity and erasing sensitivity by utilizing a recording layer for an information recording medium wherein the essential component of the recording layer is maintained in a mixed phase state.

Examples E and F in table 1 of Iwasaki '590 were cited in the Office Action as purportedly showing that there is not an increase in C/N or jitter after 10,000 overwrites.

However, Iwasaki '031, like the other cited references, does not teach or suggest that the energy density during initialization can affect the overwrite capability of the medium. Applicant does not find teaching or suggestion in Iwasaki '031 of an initialized phase-change optical recording medium as provided by the claimed invention of claim 21.

Yuzurihara, as understood by Applicant, is directed to improving overwrite capability, capability for high-speed recording and disc durability by utilizing a recording layer of a specified composition, for an optical recording medium.

Examples 18 and 21 of Yuzurihara was cited in the Office Action as purportedly disclosing a recording medium used for 35,000 and 21,000 overwrites, respectively, before jitter increases.

However, Yuzurihara, like the other cited references, does not teach or suggest that the energy density during initialization can affect the overwrite capability of the medium. Applicant

does not find teaching or suggestion in Yuzurihara of an initialized phase-change optical recording medium as provided by the claimed invention of claim 21.

Miura '116, as understood by Applicant, is directed to a phase-change type optical information recording medium having a recording layer with a quasi-stable Sb3Te phase which does **not** require initialization. Miura '121, as understood by Applicant, is directed to a rewritable optical recording medium which does not require initialization.

Therefore, it is not surprising that Miura '116 and Miura '121 do not teach or suggest that the energy density during initialization can affect the overwrite capability of the medium.

The Office Action cites to examples 8 and 22 in table 1 of Miura '116 and to examples 8 and 22 in table 1 of Miura '121. None of the cited examples relate to an initialized phase-change optical recording medium.

Applicant does not find teaching or suggestion in Miura '116 or in Miura '121 of an initialized phase-change optical recording medium as provided by the claimed invention of claim 21.

Example 5 of Ohno '049 was cited in the Office Action as disclosing an optical recording medium initialized using a 250 mW beam and a linear velocity of 2.5 m/s. It is noted that in Example 5, the linear velocity is 4.5 m/s. The Office Action contends that based on Table 4 of this application, such an initialization would have applied an energy density of less than 1,000 J/m^2. It is noted that Table 4 does not have a corresponding entry, and one cannot interpolate the entries since the area on the medium under irradiation is different from examples 5 and 6 of Ohno '049. In addition, the Office Action attempts to make a calculation that is based on a number of unsupportable assumptions.

It is noted that a prima facie case supporting the rejection must be based on facts and not assumptions or suppositions.

Applicant's calculations indicate that the energy density of the beam applied in Examples 5 and 6 of Ohno '049 was over 1100 J/m^2.

Example 5 of Ohno '310 which discloses an optical recording medium initialized using a 250 mW beam, a linear velocity of 2.5 m/s and a long axis of 50 μm (like examples 5 and 6 in Ohno '049) was cited in the Office Action.

Therefore, the energy density of the beam applied in Example 5 of Ohno '310 was similarly over 1100 J/m^2.

Sample 1B of Tominaga was cited in the Office Action as disclosing initialization at a power of 8 mW at a linear velocity of 3 m/s. However, contrary to the Office Action, Table 4 of this application is no avail for determining the energy density applied to sample 1B of Tominaga, since there is not a corresponding entry in Table 4. Again, the calculations in the Office Action are based on unsupportable assumptions.

Applicant does not find teaching or suggestion in Tominaga of a rewritable phase-change optical recording medium essentially consisting of Ag, In, Sb and Te, and initialized at least by irradiating the recording medium with a scanning beam spot emitted from a high power semiconductor laser device, wherein an energy density input by the beam spot is in a range of 600 J/m^2 to 1000 J/m^2, as provided by the claimed invention of claim 21.

Applicant simply does not find teaching or suggestion in the cited art, however, of a rewritable phase-change optical recording medium essentially consisting of Ag, In, Sb and Te, and initialized at least by irradiating the recording medium with a scanning beam spot emitted from a high power semiconductor laser device, wherein an energy density input by the beam spot is in a range of 600 J/m^2 to 1000 J/m^2, as provided by the claimed invention of claim 21.

Ando, as understood by Applicant, disclose various data that can be recorded in a lead-in area and a lead-out area on a DVD-RAM disk. Such information includes read power (for

playback), peak power (maximum recording power), and base power (maximum deletion power).

Each of Suzuki '598 and Suzuki '780, as understood by Applicant, is directed to determining an optimal recording power based on a relationship between modulation parameters and recording powers.

However, Applicant finds no teaching or suggestion in the cited art of a phase-change optical recording medium comprising a recording layer which contains information recorded in advance therein corresponding to S and R values for selecting an optimum recording power, as described in independent claim 44, or a phase-change optical recording medium comprising a recording layer which contains information regarding a P_t value recorded in advance therein, the P_t value corresponding to an optimum recording power, P_0, as described in independent claim 47.

Applicant also does not find teaching or suggestion in the cited art of an optical recording medium comprising a recording layer containing at least materials capable of carrying out read/write/erase operations through phase changes of the materials therein, wherein the recording layer essentially consists of Ag, In, Sb, Te and Ge, with a proportion in atomic percent of a(Ag): b(In): c(Sb): d(Te): e(Ge), with $0.1 \leq a \leq 7$, $2 \leq b \leq 10$, $64 \leq c \leq 92$, $5 \leq d \leq 26$ and $0.3 \leq e \leq 3$, provided that $a + b + c + d + e \geq 97$, as described in new claim 51.

In view of the remarks hereinabove, Applicant submits that the application is now in condition for allowance. Accordingly, Applicant earnestly solicits the allowance of the application.

If a petition for an extension of time is required to make this response timely, this paper should be considered to be such a petition. The Office is hereby authorized to charge any fees, including any additional claims fees, that may be required in connection with this amendment and to credit any overpayment to our Deposit Account No. 03-3125.

If a telephone interview could advance the prosecution of this application, the Examiner is

respectfully requested to call the undersigned attorney.

Respectfully submitted,

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